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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY Docket No.	CONFIRMATION NO.
09/720,761	03/26/2001	Franz Lohmer	10191/1629	5642

2644b 2500 06/07/2004

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EXAMINER

CHEN KIN-CHEN

ART UNIT

PAPER NUMBER

1765

DATE MAILED: 06/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No. 09/720,761	Applicant(s) LAERMER ET AL
Examiner Kin-Chan Chen	Art Unit 1765

— The MAILING DATE of this communication appears on the cover sheet with the correspondence address —
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(e). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 17 May 2004.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 19, 21-24 and 27-40 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 19, 21-24, 27 and 28 is/are allowed.
- 6) ☒ Claim(s) 29-40 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date: _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB-08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date: _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 29-36, 39, and 40 are rejected under 35 U.S.C. 103(a) as obvious over Flamm et al (Journal of the Electrochemical Society, Dec. 1982, USA Bd 129, Nr.12, Page 2755-2760) in view of Charlet et al. (US 5,047,115) as evidenced by Pu et al. (US 5,843,847).

Flamm teaches a method of anisotropic plasma etching a laterally defined structure in as silicon substrate using a process gas. Flamm teaches adding a fluorine-delivering etching gas to the process gas. The fluorine-delivering etching gas may include NF_3 , ClF_3 or BrF_3 (page 2756, col. 1, full paragraph 3). Flamm also teaches that plasma in a wide range of gas mixtures including CF_4 , CF_4/O_2 and $\text{C}_2\text{F}_6/\text{O}_2$ can be used to supply fluorine atoms for selective isotropic silicon etching. The said gas mixtures can deposit polymer (so-called precipitating at least one passivating material in the instant claims), see page 2755, col. 1 and 2). Because it is known that gas comprising C_2F_6 can supply fluorine atoms for selective isotropic silicon etching and deposit polymer and because it is disclosed by Flamm, hence, it would have been obvious to one with ordinary skill in the art to incorporate gas mixtures including CF_4/O_2 and $\text{C}_2\text{F}_6/\text{O}_2$ in the method of etching silicon using the fluorine-delivering etching gas including NF_3 , ClF_3 or BrF_3 .

(instant claims 19, 24, 25) and use them in any combinations thereof in order to provide their art recognized advantages and produce an expected result since they have been taught to be useful for the same purpose (etching silicon substrate), see case law cited below. Also see Pu et al. (US 5,843,847, col. 1, line 62 through col. 2, line 4) in the record as evidence for the "known" statement of depositing polymer as a passivating layer. Furthermore, Flamm teaches using C_2F_6 in anisotropic etching of silicon as stated above, because same material is used in the same process as claimed, therefore it would inherently contain same property such as a passivating material.

" It is prima facie obvious to use two compositions (two methods) each of which is taught by the prior art to be useful for the same purpose. " In re Kerkhoven 205 USPQ 1069 (CCPA 1980). In re Susi 169 USPQ 423, 426 (CCPA 1971). See also Ex parte Quadranti 25 USPQ 2d 1071 (BPAI 1992).

Unlike the claimed invention, Flamm does not disclose that He or Ne may be used in the process of etching silicon substrate. In the method of etching silicon substrate, Charlet teaches that helium or argon (instant claims 23, 28, 29, 34) may be used in the process of etching silicon substrate so as to ensure the stability of the discharge and its extension to the substrate (col. 2, lines 65-68). Hence, it would have been obvious to one with ordinary skill in the art to incorporate helium or argon as taught by Charlet in the process of Flamm in order to ensure the stability of the discharge and its extension to the substrate.

The above-cited claims specify the properties and effect of the light, ionized gas (e.g., improve selectivity, reduce charging effects, increase separation....). However, the same materials are used with the same process. It appears that the method of the

combined prior art would contain the same properties and functions as instantly claimed.

The discovery of a new property of a previously known composition, even if unobvious from the prior art, cannot impart patentability to such a composition. See *In re Spada*, 911 F.2d 705, 708, 15 USPQ2d 1655, 1657 (Fed. Cir. 1990).

Once a reference teaching product (composition) appearing to be substantially identical is made the basis of a rejection, and the examiner presents evidence of reasoning to show inherency, the burden shifts to the applicant to show an unobvious difference. Whether the rejection is based on "inherency" under 35 U.S.C. §102, or on "prima facie obviousness" under 35 U.S.C. §103, jointly or alternatively.

In re Fitzgerald, 619 F.2d 67, 70, 205 USPQ 594, 596 (CCPA 1980). See also *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433-34 (CCPA 1977).

3. Claims 29-32 and 34-40 are rejected under 35 U.S.C. 103(a) as obvious over Sony (EP 0 414 372 A2) in view of Charlet et al. (US 5,047,115).

Sony teaches a method of anisotropic plasma etching a defined structure in as silicon substrate using a process gas. Sony teaches adding a fluorine-delivering etching gas to the process gas. The fluorine-delivering etching gas may include ClF_3 . Sony also teaches that plasma in a wide range of gas mixtures including SiF_4 , Cl_2/O_2 , and Cl_2/N_2 can be used to supply fluorine atoms for selective isotropic silicon etching. The said gas mixtures can deposit protective layer (so-called precipitating at least one passivating material in the instant claims), (col.1 (page 2), lines 41-48; Col. 4 (page 3), lines 7-17). Sony teaches using dry etching to from a desired configuration in the silicon substrate. Sony is not particular about the desired configuration. Hence, it would have been obvious to one with ordinary skilled in the art to etch a laterally defined structure because it is one of the most popular structure in the semiconductor device fabrication.

Unlike the claimed invention, Sony does not disclose that He or Ne may be used in the process of etching silicon substrate. In the method of etching silicon substrate, Charlet teaches that helium or argon may be used in the process of etching silicon substrate so as to ensure the

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stability of the discharge and its extension to the substrate (col. 2, lines 65-68). Hence, it would have been obvious to one with ordinary skill in the art to incorporate helium or argon as taught by Charlet in the process of Sony in order to ensure the stability of the discharge and its extension to the substrate.

The above-cited claims specify the properties and effect of the light, ionized gas (e.g., improve selectivity, reduce charging effects, increase separation....). However, the same materials are used with the same process. It appears that the method of the combined prior art would contain the same properties and functions as instantly claimed.

The discovery of a new property of a previously known composition, even if unobvious from the prior art, cannot impart patentability to such a composition. See *In re Spada*, 911 F.2d 705, 708, 15 USPQ2d 1655, 1657 (Fed. Cir. 1990).

Once a reference teaching product (composition) appearing to be substantially identical is made the basis of a rejection, and the examiner presents evidence of reasoning to show inherency, the burden shifts to the applicant to show an unobvious difference. Whether the rejection is based on "inherency" under 35 U.S.C. §102, or on "prima facie obviousness" under 35 U.S.C. §103, jointly or alternatively

In re Fitzgerald, 619 F.2d 67, 70, 205 USPQ 594, 596 (CCPA 1980). See also *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433-34 (CCPA 1977).

Response to Arguments

4. Applicant's arguments (May, 2004) have been fully considered but they are not persuasive.

Applicant has argued that the combined prior art does not teach the properties of the light, easily ionized gas (e.g., improve selectivity, reduce charging effects, increase separation....). It is not persuasive. As stated in the office action, the same materials are used with the same process. It appears that the method of the combined prior art would

contain the same properties and functions as instantly claimed, also see the related case law cited above.

Applicant has argued that Sony does not teach the addition of SiF_4 . In fact, Sony teaches using SiF_4 for etching the silicon (col. 4, lines 7-11).

Conclusion

5. Claims 19, 21-24, 27, and 28 are allowed.

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Pu et al. (US 5,843,847; col. 1, line 62 through col. 2, line 4) teaches that fluorocarbon gas containing C_2F_6 forms polymeric by products that deposits as a passivating layer.

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

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8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kin-Chan Chen whose telephone number is (703) 305-0222. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on (703) 305-2667. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-2934.

June 3, 2004



Kin-Chan Chen
Primary Examiner
Art Unit 1765